UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

137699

SUBJECT: Proposed use of EPA threshold values for Dixie Cavern Landfill sludge pit closure

DATE: April 4, 1989

FROM: Roy L. Smith, Ph.D.
Toxicologist (3HW16)

TO: Christopher P. Thomas
CERCLA Removal Enforcement Section (3HW14)

Of the six proposed soil concentrations, only one is out of line: 1,1-dichloroethene. EPA considers 1,1-DCE a class C (possible human) carcinogen, having a cancer potency slope of 0.6 $(mg/kg/d)^{-1}$. Region III has used this potency slope as the basis of past cleanup decisions.

Here is a quick calculation which illustrates my concern: the proposed closure level of 625 mg 1,1-DCE/kg soil would translate to an equilibrium leachate concentration of about 10,000 µg/l (arrived at by assuming a K_{oc} of 65 and waste which is 100% organic carbon). If the leachate were diluted by 2 orders of magnitude by the time it reached the property boundary, the concentration of 1,1-DCE in off-site groundwater could still be as high as 100 µg/l.

The 1,1-DCE concentration which translates to a 1×10^{-6} lifetime cancer risk from ingesting groundwater is 0.06 µg/l (10^{-6} risk = 0.06 µg/l * 2 l/d * 1 mg/1000 µg * 1/70 kg * 0.6 $(mg/kg/d)^{-1}$. This suggests the soil level is high by a factor of perhaps 2000 (100/0.06, rounded to 1 significant figure).

Obviously, this analysis is extremely crude, and needs to be refined with site-specific data on actual soil and groundwater quality, aquifer characteristics, etc. However, it also seems obvious that the proposed closure level for 1,1-DCE in soil is not protective.

cc: Laura Boornazian (3HW16)